

CLAIMS

WE CLAIM:

1. A composition comprising:
 - (a) a hydrogel comprising:
 - (i) a water-swellable, water-insoluble polymer;
 - (ii) a blend of a hydrophilic polymer with a complementary oligomer capable of hydrogen or electrostatic bonding to the hydrophilic polymer; and
 - (iii) an optional active agent; and
 - (b) a backing member, where the backing member is comprised of a polymer composition that erodes in a moist environment at a slower rate than the hydrogel.
2. The composition of claim 1, wherein the water-swellable, water-insoluble polymer is a cellulose ester, alginic acid, or an acrylate polymer.
3. The composition of claim 2, wherein the cellulose ester is comprised of at least one cellulosic polymer containing unesterified cellulose monomer units, cellulose acetate monomer units, and either cellulose butyrate monomer units or cellulose propionate monomer units.
4. The composition of claim 2, wherein the acrylate polymer is selected from polymers and copolymers of acrylic acid, methacrylic acid, methyl acrylate, ethyl acrylate, methyl methacrylate, or ethyl methacrylate.
5. The composition of claim 1, wherein the hydrophilic polymer is selected from poly(N-vinyl lactams), poly(N-vinyl amides), poly(N-alkylacrylamides), polyacrylic acids, polymethacrylic acids, polyvinyl alcohol, polyvinylamine, and copolymers and blends thereof.
6. The composition of claim 1, wherein the complementary oligomer is selected from polyhydric alcohols, monomeric and oligomeric alkylene glycols, polyalkylene glycols, carboxyl-terminated polyalkylene glycols, amino-terminated polyalkylene glycols, ether alcohols, alkane diols and carbonic diacids.
7. The composition of claim 1 wherein the complementary oligomer is capable of hydrogen or electrostatic bonding to the water-swellable, water-insoluble polymer.

8. The composition of claim 1, wherein the backing member is comprised of a material selected from acrylate polymers, cellulose derived polymers, cellulose esters, starches, alginic acid, alginates, polyamino acids, and combinations thereof.
9. The composition of claim 8, wherein the acrylate polymer is selected from polymers formed from acrylic acid, methacrylic acid, methyl acrylate, ethyl acrylate, methyl methacrylate, and ethyl methacrylate.
10. The composition of claim 8, wherein the cellulose derived polymer is selected from hydratecellulose, methyl cellulose, ethyl cellulose, hydroxyethyl cellulose, hydroxypropylcellulose, hydroxypropylmethylcellulose, carboxymethylcellulose, sodium carboxymethylcellulose, and mixtures thereof.
11. The composition of claim 8, wherein the cellulose ester is selected from cellulose acetate, cellulose acetate propionate, cellulose acetate butyrate, cellulose propionate, cellulose butyrate, cellulose propionate butyrate, cellulose diacetate, cellulose triacetate, and mixtures, polymers and copolymers thereof.
12. The composition of claim 8, wherein the starch is selected from potato starch acetate, maize starch, and mixtures thereof.
13. The composition of claim 8, wherein the alginate is selected from propylene glycol alginate, sodium alginate, calcium alginate, and mixtures thereof.
14. The composition of claim 8, wherein the polyamino acid is selected from polylysine, polyglycine, polyalanine, protamine, and mixtures thereof.
15. The composition of claim 1, wherein the water-swellable, water-insoluble polymer and the backing member are comprised of acrylate polymers, and the backing member acrylate polymer has a lower solubility than the water-swellable, water-insoluble acrylate polymer.
16. The composition of claim 1, wherein the relative quantities of the water-swellable, water-insoluble polymer, the hydrophilic polymer, and the complementary oligomer are selected so as to render the hydrogel translucent.
17. The composition of claim 1, wherein the hydrogel is a solid.
18. The composition of claim 17, which comprises about 0.1-60 wt% of an active agent.
19. The composition of claim 17, which comprises about 1-20 wt% of water-swellable water-insoluble polymer.

20. The composition of claim 17, which comprises about 20-80 wt% of a hydrophilic polymer.
21. The composition of claim 17, which comprises about 10-50 wt% of a complementary oligomer.
22. The composition of claim 1, wherein the hydrogel is a liquid or gel.
23. The composition of claim 22, which comprises about 0.1-60 wt% of an active agent.
24. The composition of claim 22, which comprises about 0.1-20 wt% of water-swellable water-insoluble polymer.
25. The composition of claim 22, which comprises about 1-40 wt% of a hydrophilic polymer.
26. The composition of claim 22, which comprises about 0.1-20 wt% of a complementary oligomer.
27. The composition of claim 1, which further comprises an absorbent filler.
28. The composition of claim 1, wherein the composition is a pressure sensitive adhesive and absorbs water.
29. The composition of claim 1, wherein the hydrogel erodes about 1 second to 24 hours after placement in a moist environment.
30. The composition of claim 29, wherein the hydrogel erodes about 10 seconds to 8 hours after placement in a moist environment.
31. The composition of claim 1, wherein the backing member erodes in the moist environment about 12 to 24 hours after the hydrogel has eroded.
32. The composition of claim 31, wherein the backing member erodes in the moist environment about 12 hours after the hydrogel has eroded.
33. The composition of claim 1, wherein the backing member erodes at least about 25% slower than the hydrogel.
34. The composition of claim 33, wherein the backing member erodes at least about 50% slower than the hydrogel.
35. The composition of claim 34, wherein the backing member erodes at least about 100% slower than the hydrogel.
36. The composition of claim 35, wherein the backing member erodes at least about 200% slower than the hydrogel.

37. The composition of claim 1, wherein the hydrogel is a solid and is attached to the backing member prior to use.
38. The composition of claim 1, wherein the hydrogel is a liquid or a gel and is attached to the backing member during use.
39. The composition of claim 1, wherein the active agent is present.
40. The composition of claim 39, wherein the backing member is impermeable to the active agent.
41. The composition of claim 39, wherein the backing member is selectively permeable to the active agent.
42. The composition of claim 39, wherein the active agent is a whitening agent selected from the group consisting of peroxides, metal chlorites, perborates, percarbonates, peroxyacids, and combinations thereof.
43. The composition of claim 42, wherein the peroxide is selected from the group consisting of hydrogen peroxide, calcium peroxide, magnesium peroxide, carbamide peroxide, and mixtures thereof.
44. The composition of claim 42, wherein the peroxide is selected from the group consisting of dialkyl peroxides, diacyl peroxides, peresters, perdicarbonates, ketone peroxides, and hydroperoxides.
45. The composition of claim 42, wherein the metal chlorite is selected from the group consisting of calcium chlorite, barium chlorite, magnesium chlorite, lithium chlorite, sodium chlorite, potassium chlorite, hypochlorite, and chlorine dioxide.
46. The composition of claim 1, further comprising a flavorant.
47. The composition of claim 46, wherein the flavorant is selected from the group consisting of wintergreen, peppermint, spearmint, menthol, fruit flavors, vanilla, cinnamon, spices, flavor oils and oleoresins, and combinations thereof.
48. The composition of claim 1, further comprising a sweetener selected from the group consisting of sucrose, fructose, aspartame, xylitol and saccharine.
49. The composition of claim 1, further comprising at least one additive selected from the group consisting of fillers, preservatives, pH regulators, softeners, thickeners, colorants, pigments, dyes, refractive particles, flavorants, sweeteners, stabilizers, toughening agents, detackifiers, and permeation enhancers.

50. A method for whitening teeth comprising:
applying the composition of claim 1 to teeth in need of whitening.
51. The method of claim 50, which further comprises removing the composition when the desired degree of whitening has been achieved.
52. The method of claim 50, wherein the hydrogel is a solid and is attached to the backing member, and wherein the applying step comprises applying the composition in a single step.
53. The method of claim 50, wherein the hydrogel is a non-solid, and wherein the applying step comprises applying the hydrogel to the teeth and subsequently applying the backing member to the hydrogel.
54. The method of claim 50, wherein the composition includes a release liner, and the release liner is removed prior to application of the composition to the teeth.
55. The method of claim 50, wherein the desired degree of whitening is achieved after a predetermined period of time.
56. The method of claim 55, wherein the predetermined period of time is from about 10 minutes to about 24 hours.
57. The method of claim 56, wherein the predetermined period of time is from about 10 minutes to about 8 hours.
58. The method of claim 57, wherein the predetermined period of time is about 30 minutes to 1 hour.
59. The method of claim 50, wherein the composition can be worn for an extended period of time.